

CLAIMS

1. A signal detection system which detects signals similar to a target signal from stored signals which are stored, comprising:

5 a target signal feature quantity calculation section which derives a feature quantity series from a target signal;

a stored signal feature quantity calculation section which derives a feature quantity series from a stored signal;

10 a target signal histogram calculation section which sets a predetermined observation window in a feature quantity series derived in said target signal feature quantity calculation section, and calculates a histogram of the feature quantities within said observation window;

a stored signal histogram series calculation section which obtains a histogram series in regard to a feature quantity series derived in said stored signal feature quantity calculation section, by sequentially setting a predetermined observation window with
15 respect to each section of a size which corresponds to said observation window, and calculating a histogram of feature quantities within said observation window;

a stored signal histogram grouping section which groups histogram series sets in a histogram series obtained from said stored signal histogram series calculation section, for
20 which a mutual similarity level calculated with a predetermined L1 distance measure satisfies a predetermined criteria;

a stored signal histogram group selection section which determines the existence of a possibility of the inclusion of an area which should be output from within a histogram group obtained in said stored signal histogram grouping section, and selects
25 the group which has a possibility;

a stored signal collation section which performs collation with respect to histograms belonging to a histogram group selected in said stored signal histogram group selection section, by said predetermined L1 distance measure, and obtains a similarity value; and

5 a collation result output section which determines whether or not the collated area is to be made a detection result, by the similarity value obtained in said stored signal collation section, and outputs the collated area in a case where it has been determined it is to be made a detection result.

10 2. A signal detection system according to claim 1, wherein said stored signal histogram grouping section performs histogram grouping based on a threshold value of the L1 distance measure.

3. A signal detection system according to either one of claim 1 and claim 2, wherein
15 there is provided a stored signal histogram thinning section for thinning the histogram in the histogram series obtained in said stored signal histogram series calculation section.

4. A signal detection system according to any one of claim 1 through claim 3, wherein said stored signal histogram grouping section comprises either one of:

20 a stored signal histogram local grouping section which groups histogram sets in a histogram which are continuous in said histogram series, for which a mutual similarity level satisfies a predetermined criteria, and

 a stored signal histogram global grouping section which groups histogram sets in all histograms in said histogram series, for which a mutual similarity level satisfies a
25 predetermined criteria.

5. A signal detection system according to one of claim 1 through claim 3, wherein said stored signal histogram grouping section comprises:

5 a stored signal histogram local grouping section which groups histogram sets in a histogram which are continuous in said histogram series, for which a mutual similarity level satisfies a predetermined criteria, and

a stored signal histogram global grouping section which groups histogram sets in all histograms in said histogram series, for which a mutual similarity level satisfies a predetermined criteria.

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6. A signal detection method for detecting signals similar to a target signal from stored signals which are stored, comprising:

a target signal feature quantity calculation step for deriving a feature quantity series from a target signal;

15 a stored signal feature quantity calculation step for deriving a feature quantity series from a stored signal;

a target signal histogram calculation step for setting a predetermined observation window in a feature quantity series derived in said target signal feature quantity calculation step, and calculating a histogram of the feature quantities within said observation window;

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a stored signal histogram series calculation step for obtaining a histogram series in regard to a feature quantity series derived in said stored signal feature quantity calculation step, by sequentially setting a predetermined observation window with respect to each section of a size which corresponds to said observation window, and
25 calculating a histogram of feature quantities within said observation window;

a stored signal histogram grouping step for grouping histogram series sets in a histogram series obtained from said stored signal histogram series calculation step, for which a mutual similarity level calculated with a predetermined L1 distance measure satisfies a predetermined criteria;

5 a stored signal histogram group selection step for determining the existence of a possibility of the inclusion of an area which should be output from within a histogram group obtained in said stored signal histogram grouping step, and selecting the group which has a possibility;

a stored signal collation step for performing collation with respect to histograms
10 belonging to a histogram group selected in said stored signal histogram group selection step, by said predetermined L1 distance measure, and obtaining a similarity value; and

a collation result output step for determining whether or not the collated area is to be made a detection result, by the similarity value obtained in said stored signal collation step, and outputting the collated area in a case where it has been determined it is to be
15 made a detection result.

7. A signal detection method according to claim 6, wherein said stored signal histogram grouping step performs histogram grouping based on an upper threshold value of the L1 distance measure.

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8. A signal detection method according to either one of claim 6 and claim 7, wherein there is provided a stored signal histogram thinning step for thinning the histogram from the histogram series obtained in said stored signal histogram series calculation step.

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9. A program for executing processing for detecting signals similar to a target signal from stored signals which are stored, for executing on a computer, comprising:

a target signal feature quantity calculation process for deriving a feature quantity series from a target signal;

5 a stored signal feature quantity calculation process for deriving a feature quantity series from a stored signal;

a target signal histogram calculation process for setting a predetermined observation window in a feature quantity series derived in said target signal feature quantity calculation process, and calculating a histogram of the feature quantities within

10 said observation window;

a stored signal histogram series calculation process for obtaining a histogram series in regard to a feature quantity series derived in said stored signal feature quantity calculation process, by sequentially setting a predetermined observation window with respect to each section of a size which corresponds to said observation window, and

15 calculating a histogram of feature quantities within said observation window;

a stored signal histogram grouping process for grouping histogram series sets in a histogram series obtained from said stored signal histogram series calculation process, for which a mutual similarity level calculated with a predetermined L1 distance measure satisfies a predetermined criteria;

20 a stored signal histogram group selection process for determining the existence of a possibility of the inclusion of an area which should be output from within a histogram group obtained in said stored signal histogram grouping process, and selecting the group which has a possibility;

a stored signal collation process for performing collation with respect to
25 histograms belonging to a histogram group selected in said stored signal histogram group

selection process, by said predetermined L1 distance measure, and obtaining a similarity value; and

a collation result output process for determining whether or not the collated area is to be made a detection result, by the similarity value obtained in said stored signal
5 collation process, and outputting the collated area in a case where it has been determined it is to be made a detection result.

10. A computer readable recording medium recorded with a program for executing processing for detecting signals according to claim 9.